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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LIN, JAMES	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/730,041	RAINA, KANWAL K.	
	Examiner	Art Unit	
	Jimmy Lin	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 24-25, 29, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Niiyama et al. (5,656,330).

Niiyama discloses a method of treating at least one flat panel display current emitter, comprising:

exposing at least a portion of said at least one current emitter 101 to a hydrogenation process (column 4, lines 54-55) comprising PECVD process conducted in the presence of a silane gas in a reaction chamber;

and exposing at least a portion of said at least one current emitter to a nitrogen infusion process (column 4, lines 30-39).

The current emitter of Niiyama is a lower electrode. By definition, an electrode is a current emitter. Since the current specification does not specify that the current emitter is only limited to the emitter tip of an FED, the broadest interpretation of a current emitter can be an electrode.

The current emitter would be arranged in an open area before the hydrogenation and nitrogen infusion process because no layers have been deposited over the current emitter before said process steps. Although the Applicant's specification refers to "an open area" as 126 of Fig. 2, the specification has not explicitly defined the term. Thus, the broadest reasonable interpretation of "arranged in an open area" can include a layer having no addition layers deposited over it.

Claim 25: The nitrogen infusion process can be conducted in the same reactor chamber following the PECVD process (column 6, lines 66-column 7, line 6).

Claim 29: Niiyama teaches that the substrate can be made of glass (column 4, lines 17-18). The current emitter is deposited onto the glass substrate (i.e., an insulator).

Claim 32: Niiyama teaches treating the tip of the current emitter 101 to form the resistive layer 102, wherein the tip is the corner of the current emitter (Fig. 4). The forming of the resistive layer will necessarily cover at least a portion of the current emitter tip.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niiyama et al. (5,656,330), as applied to claim 24 above.

Claim 30: Niiyama does not explicitly teach [redacted] the hydrogenation process and the nitrogen infusion process on a plurality of current emitters. However, performing both processes on multiple substrates would greatly increase the output and efficiency of the process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the hydrogenation process and the nitrogen infusion process of Niiyama on a plurality of current emitters. One would have been motivated to do so in order to increase efficiency and reduce the costs of production.

6. Claims 26-28, and 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niiyama et al. (5,656,330), as applied to claim 24 above, in view of Feng et al. (5,902,650).

Claim 33: Niiyama discloses a process of depositing a resistive layer 102 onto a current emitter 101 (column 6, lines 1-6), but does not explicitly teach the flow rate of silane. However, Feng teaches a method of exposing an FED to a PECVD process in the presence of a silane gas and a nitrogen infusion process, wherein the silane flow rate can be 1000 sccm (Examples 3-10; column 3, lines 23-62). The process of fang produces controlled conductivity and low stress of the resistive layer (column 3, lines 4-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the silane flow rate of Feng because Feng teaches that such operating conditions forms a resistive layer with desirable properties.

Claim 26: Niiyama is discussed above, but does not teach that the ammonia is used in the nitrogen infusion process. However, Feng teaches that the nitrogen infusion process can be conducted in the presence of ammonia gas (Examples 3-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used ammonia in the nitrogen infusion process of Niiyama because Feng teaches that ammonia supplies the necessary nitrogen atoms for such a process.

Claim 35: Feng teaches that the nitrogen infusion process is conducted in the presence of ammonia gas (Examples 3-8).

Claims 27,34,37: Feng teaches a PECVD process conducted with a silane gas flow rate of 1000 sccm and 300W RF power (Example 3). Although Example 3 specifies a chamber pressure of 2000 mtorr, Feng teaches that an operable pressure of the chamber can be between 500-5000 mtorr (column 5, lines 22-24). One skilled in the art would have operated the PECVD process within the pressure range as taught by Feng with a reasonable expectation of success.

Niiyama and Feng do not explicitly teach that the PECVD process is conducted for a period of about 5-10 minutes. However, Feng teaches the desirability of depositing an amorphous silicon based film having electrical conductivity in an intermediate range between that of intrinsic amorphous silicon and n^+ dope amorphous (column 3, lines 4-9). The thickness of the silicon layer largely depends on the deposition time. A particular parameter may first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be

characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have determined the optimum operating time for the PECVD process of Feng by routine experimentation. One would have been motivated to do so in order to achieve the desired thickness and characteristics of the silicon film.

Claims 28,36,38: Feng teaches a nitrogen infusion process conducted with an ammonia gas flow rate of 500 sccm and 300W RF power (Example 3). Although Example 3 specifies a chamber pressure of 2000 mtorr, Feng teaches that an operable pressure of the chamber can be between 500-5000 mtorr (column 5, lines 22-24). One skilled in the art would have operated the PECVD process within the pressure range as taught by Feng with a reasonable expectation of success.

Niiyama and Feng do not explicitly teach that the PECVD process is conducted for a period of about 5-10 minutes. However, Feng teaches that a reactant gas mixture containing phosphine and ammonia is used to control the conductivity and stress. The conductivity of the n^+ doped amorphous silicon is controlled by adjusting the amount of phosphorus atoms contained in the film (column 2, lines 52-54). The operating time of the nitrogen infusion process would directly affect the amount of phosphorus atoms contained in the film. A particular parameter may first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have determined the optimum operating time for the nitrogen infusion process of Feng by routine experimentation. One would have been motivated to do so in order to achieve the desired conductivity of the amorphous silicon film.

7. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niiyama et al. (5,656,330) in view of Zhang et al. (6,323,587).

Niiyama is discussed above, but does not explicitly teach that the plurality of current emitters in a field emission display device is sealed. However, Zhang teaches that a conventional FED has a baseplate, which includes the current emitter, sealed to a faceplate

(column 1, lines 17-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have sealed the baseplate of Niiyama. One would have been motivated to do so in order to manufacture a functioning FED.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 24-38 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 7,101,586. Although the conflicting claims are not identical, they are not patentably distinct from each other because they merely represent different combinations and permutations of the various claimed features.

Examiner's Note

10. The provisional nonstatutory obviousness-type double patenting over application number 10/120,511 has been changed to a *non-provisional* nonstatutory obviousness-type double patenting in light of the issuance of the application to U.S. Patent No. 7,101,586.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ahn et al. (2004/0189175) and Itoh et al. (U.S. Patent 5,469,014) teach a method of nitrogen infusion on the emitter tip of a field emission device. Sung et al. (U.S. Patent 6,171,927) teaches the use of ammonia in plasma source ion implantation of nitrogen (col. 4, lines 17-34).

Response to Arguments

12. Applicant's arguments filed 10/27/2006 have been fully considered but they are not persuasive.

Claims 24-25, 29, and 32 as rejected over Niiyama '330:

The Applicant argues that the Office Action has mischaracterized the resistive layer 102 as an "electrode". However, the Office Action clearly states that the interpretation of the current emitter is the electrode 101. See discussion above.

The Applicant argues that Niiyama does not disclose conducting the nitrogen infusion process in the same reaction chamber following the PECVD process. However, Niiyama teaches that the nitrogen infusion process and the PECVD process can occur simultaneously (col. 4, lines 30-61). Thus, the infusion process occurs following the start of the PECVD process.

13. Applicant's arguments filed 11/14/2006 have been fully considered but they are not persuasive.

The Applicant argues that Niiyama does not disclose a current emitter arranged in an open area of the flat panel display. However, Niiyama can be interpreted to include such a limitation, as discussed above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JL

JL

KEITH HENDRICKS
PRIMARY EXAMINER